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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/886,625	06/20/2001	Ho Yin Tang	40226/DMC/B553	4370

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EXAMINER
RIBAR, TRAVIS B

ART UNIT	PAPER NUMBER
1711	7

DATE MAILED: 06/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/886,625	TANG ET AL.
	Examiner	Art Unit
	Travis B Ribar	1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Peri d f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 5-9 is/are rejected.

7)☒ Claim(s) 8 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5, 6 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-4, drawn to a material for use as a positive coefficient temperature device, classified in class 524, subclass 495.

   II. Claims 5-9, drawn to a positive coefficient device and a method of manufacturing the device, classified in class 428, subclass 688.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the polymer in the combination does not need to be semi-crystalline. The subcombination has separate utility such as a coating composition.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mr. Daniel M. Cavanagh on May 13, 2002 a provisional election was made without traverse to prosecute the invention of a positive

coefficient device and the method of producing the device, claims 5-9. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-4 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Oath/Declaration

6. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:
It does not include the signature of the second inventor.

Specification

7. The cross-reference to the provisional US application (page 1, lines 5-10) does not include the filing date of the provisional application. Please amend the specification to include that date.

Claim Objections

8. Claim 8 is objected to because of the following informalities:

In line 2, the word, "approximate" should be, "approximately". Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Regarding claim 7, it is unclear from the language of the claim how the "plasticizer comprises approximately tem percent of the polymeric compound." For the purposes of this examination, this claim will be presumed to mean that the plasticizer is present in an amount of about 10 percent by weight based on the total amount of polymeric compound present in the composition.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application

published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

13. Claims 5-6 and 8-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Handa et al.

Handa et al. discloses an organic positive temperature coefficient (PTC) composition that is useful in circuit protection because it protects the circuit from excess current (column 1, line 6). The composition that makes up the PTC includes a polymer (column 4, line 55 to column 5, line 29), a plasticizer (column 4, lines 4-26), and conductive particles (column 5, lines 30-35). The PTC is formed into a laminate structure that includes two laminar foils (column 7, lines 4-21). Handa et al. therefore meets all of the elements of claim 1.

The polymer in the PTC is polyethylene—a semi-crystalline polymer as defined by the applicant (see page 3, lines 9-14 of the specification). Handa et al. also therefore fulfills the requirements of claim 6.

The switching temperature of the PTC in Handa et al. is the same as the switching temperature defined by the applicant in claim 8 (column 4, lines 30-33), and the process used to prepare the PTC device that the applicant claims in claim 9 is also the same as the process used in the reference (column 6, lines 34-43 and column 7, lines 4-21).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Konynenburg et al. in view of Handa et al.

Van Konynenburg et al. discloses PTC compositions that include semi-crystalline polymer (column 8, line 29), a plasticizer (column 10, lines 53-67), and conductive carbon black particles (column 6, lines 59-66) and that have a switching temperature around 70°C (see figure 3).

Regarding claim 7 in the present application, van Konynenburg et al. does not disclose a composition that contains two different carbon blacks. However, the method for choosing which specific carbon black is to be used in a specific composition is taught (column 6, lines 21 to column 7, line 5). Since the relevant characteristics of many different types of carbon black are listed in the reference (table 1) and since many of the carbon blacks have similar properties (e.g. types 1 and 2 in the table), it would have been obvious to one skilled in the art that a mixture of two similarly suitable carbon blacks would also produce a suitable PTC composition.

Van Konynenburg et al. also does not expressly teach that the amount of plasticizer in the composition should be about 10 percent of the total weight of the polymer compound. It does teach that the amount of plasticizer should be chosen based on the processing conditions that the user requires. The motivation for including

any specific amount of plasticizer to the composition is therefore stated, and it would have been obvious to one skilled in the art to use any amount of plasticizer needed in the composition, including about 10 percent plasticizer, in order to ease the processing of the PTC composition.

Van Konynenburg et al., as applied above, teaches the PTC composition that the applicant claims and teaches that the composition may be used in many different applications (column 1, lines 50-65). However, van Konynenburg et al. does not explicitly include the laminate structure that the applicant claims in claim 5 or the process to produce the structure claimed in claim 9.

Handa et al. is discussed above and discloses a known method for producing a PTC device (claim 9) as well as the laminate structure of claim 5.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the composition taught in van Konynenburg et al. in the laminate structure and process for producing the structure taught in Handa et al. The motivation for doing so would be to create an easily processed PTC suitable for use in as a circuit protector. Therefore it would have been obvious to combine Handa et al. with van Konynenburg et al. to obtain the invention as specified in claims 5-9.

16. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Konynenburg et al. in view of Handa et al. as applied to claim 7 above, and further in view of Frentzel et al.

The combined teachings of Konynenburg et al. and Handa et al. are discussed above, but do not expressly specify the amount of plasticizer used in the PTC compositions. Frentzel et al. discloses the use of plasticizers in PTC compositions (column 11, lines 11-22) that are in the range specified by the applicant in claim 7. These plasticizers are used for various purposes, including controlling the viscosity of the composition.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use about 10 percent plasticizer in the inventions taught by the combined teachings of van Konynenburg et al. and Handa et al. The motivation for doing so would be to control the viscosity of the PTC composition. Therefore it would have been obvious to combine Frentzel et al. with van Konynenburg et al. and Handa et al. to obtain the invention as specified in claim 7.

17. Claims 5-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frentzel et al. in view of Handa et al.

Frentzel et al. discloses a PTC composition useful in electrical circuit protection (column 1, lines 60-62). The PTC composition comprises a semi-crystalline polymer (column 3, lines 3-24), a plasticizer (column 11, lines 11-22), and conductive particles (column 1, lines 40-44), meeting these aspects of claims 5 and 6. The composition includes about 10% plasticizer (column 11, lines 11-22) and has a switching temperature of around 70°C (column 2, lines 55-67), meeting that requirement of the

applicant's claim 8. However, Frentzel et al. does not include the laminate structure of claim 1,

Handa et al. is discussed above and shows the laminate structure of claim 1 (column 7, lines 4-21) and the process for producing the laminate structure (claim 9) as a PTC device.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the PTC composition in Frentzel et al. as part of a laminate structure such as that shown by the laminate PTC device disclosed in Handa et al. The motivation for doing so would be to create a PTC device. Therefore it would have been obvious to combine Frentzel et al. with Handa et al. to obtain the invention as specified in claims 5-6 and 8.

18. Claims 7 and 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Frentzel et al. in view of Handa et al. as applied to claim 5 above, and further in view of van Konynenburg et al.

The combined teachings of Frentzel et al. and Handa et al. are discussed above. Even though Frentzel et al. discloses conductive particles dispersed within the polymer matrix that include carbon, it does not expressly teach that carbon black or mixtures of carbon black are present in the PTC composition. Van Konynenburg discloses both.

Van Konynenburg et al. teaches compositions including carbon black as conductive particles (column 6, lines 59-66), but does not explicitly disclose a composition that contains two different carbon blacks. Even though, the method for

choosing which specific carbon black is to be used in a specific composition is taught by the reference (column 6, lines 21 to column 7, line 5). Since the relevant characteristics of many different types of carbon black are listed in the reference (table 1) and since many of the carbon blacks have similar properties (e.g. types 1 and 2 in the table), it would have been obvious to one skilled in the art that a mixture of two similarly suitable carbon blacks would also produce a suitable PTC composition. The reference therefore meets this aspect of claim 7.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use carbon black or a mixture of two types of carbon black as the conductive particles in the PTC composition in Frentzel et al. The motivation for doing so would be that both carbon black and mixtures of carbon blacks have been shown to be suitable conductive particles for use in PTC compositions.

Also at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the method for producing a PTC laminate that is shown in Handa et al. to form a PTC laminate out of the composition taught above. The motivation for doing so would be that such a process is known to produce suitable PTC laminates. Therefore it would have been obvious to combine van Konynenburg with Frentzel et al. and Handa et al. to obtain the invention as specified in claims 7 and 9.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cheng discloses a PTC device utilizing a semi-crystalline polymer and carbon black.

Sadhir et al. discloses a PTC device including a semi-crystalline polymer and carbon black.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Travis B Ribar whose telephone number is (703) 305-3140. The examiner can normally be reached on 8:30-5:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Travis B Ribar
Examiner
Art Unit 1711

TBR
June 2, 2002

James J. Seidleck
Supervisory Patent Examiner
Technology Center 1700